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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to a network printer and relates to the network printer which processes the printing demand from an upper device especially according to the priority set up beforehand.
[0002]
[Description of the Prior Art]The conventional example indicated to JP,4-79638,A is shown in drawing 8 and drawing 9.
[0003]The network printer system shown in drawing 8 comprises the print server 71 which spools the print data transmitted from the terminal A equivalent to a high order host, and the terminals B and these terminals to internal buffer A and B, and the printer 72 which carries out the printout of the spooled data.
[0004]Among these, CPU81 in which the print server 71 manages control of the whole print server, The LANI/O port 82 which manages the interface of LAN75 and controls the data input/output between LAN75, Printer I/O Port 83 which manages an interface with the printer 72, It comprises ID table 86 including the priority 92 of printing set up for every user ID of the buffer A which saves data (ranking A) with a high printing priority as cue, the buffer B which saves data (ranking B) with a low printing priority as cue, and each terminal, and ID concerned.

[0005]Here, as shown in drawing 9, ID91 of the user who uses each terminal, and the priority 92 of printing given to the ID are beforehand registered into ID table 86 as a pair. The print data of the high ranking A of a priority are stored in the buffer A, and the print data of the low-priority ranking B are stored in the buffer B. That is, it is possible to fluctuate the number of the printing priorities which can be treated according to the number of the buffers to form.
[0006]And when performing printing from the terminal A73, the terminal A73 transmits the user

ID corresponding to the terminal A73 to the print server 71 with print data. The print server 71 specifies a printing priority corresponding from the user ID which received with reference to ID table 86. When the priority over the terminal A is the ranking A here, the received print data are spooled to the buffer A84 in the print server 71.

[0007]Similarly, when printing is performed from the terminal B74, in addition to print data, the user ID of the terminal B is transmitted to the print server 71. When the priority corresponding to this ID is the ranking B, the print server 71 spools the received print data to the buffer B85.

[0008]The print server 71 checks whether print data exist in the high buffer A84 of a priority first in a printing job. When print data exist in the buffer A84, data is sucked up in the spooled turn and data is transmitted to the printer 72 via printer I/O Port 83. Since the data from the terminal 73A is held now at the buffer A84, printing from the terminal A has priority and is outputted. When all the data spooled or print data did not exist in the buffer A84 carries out the completion of transmitting at the printer 72, the print server 71 checks whether print data exist in the low-priority buffer B85. Since the print data from the terminal B74 are held now, print data are sucked up from the buffer B85, and it is transmitted to the printer 72 via printer I/O Port 83.

[0009]

[Problem(s) to be Solved by the Invention]However, if it was in the above-mentioned conventional example, there was the following inconvenience.

[0010]Since the 1st had to define user ID as every terminal (high order host) and each terminal had to add the ID to data, the existing general-purpose Network OS could not be used as it was, but it was in charge of operation-ization and there was inconvenience accompanied by change of Network OS.

[0011]Since the 2nd needed to form two or more buffers according to the division numbers of a priority, regardless of the frequency in use of a buffer, the required storage capacity (memory) had to be secured beforehand, and there was inconvenience which invites a high cost.

[0012]

[Objects of the Invention]This invention, without improving the inconvenience which this conventional example has and being especially accompanied by no change of the existing general-purpose Network OS, The printing demand from two or more servers or terminals (user) can be processed according to the priority set up beforehand, and it sets it as the purpose to provide the network printer which does not need the buffer which spools the data concerned in connection with the prioritization of data.

[0013]

[Means for Solving the Problem]a transmission and reception means send and receive a data packet between a upper devices in the invention according to claim 1 in order to attain the above-mentioned purpose, and b -- it has a data type discrimination section which extracts a printing data packet and a printing request packet from a data packet received by this transmission and reception means. It has a priority level table which set up a printing priority for every MAC Address of c upper device, and a queue table which registers a printing demand from d upper device by a predetermined priority. Furthermore, e) Extract a MAC Address of an upper device which is a transmitting agency from a printing request packet extracted by a data type discrimination section, It has a sequence control means to acquire a printing priority corresponding to an extracted MAC Address from a priority level table, and to register a MAC Address of the upper device concerned into a queue table according to an acquired priority. In addition, a print-data treating part which carries out sequential processing of the printing data packet extracted by f data type discrimination section, and carries out a printout, g) A print-data treating part's completion of processing of a printing data packet group corresponding to one printing demand has taken composition of having a Request-to-Send part which replies a Request-to-Send packet by making into a reply place a MAC Address registered into a head of a queue table.

[0014]In this invention, when a printing request packet is received from a high order host, based on a transmitting agency MAC Address of the packet, a priority of a printing job to the printing demand concerned is specified, A MAC Address of a high order host who performed a printing demand according to the priority is registered into a queue table one by one. And whenever processing of a print-data group corresponding to a printing demand of 1 is completed by a print-data treating part, a printing demand is read sequentially from a head of a queue table, and a high order host who has an applicable MAC Address is notified of a Request to Send of a purport that print data should be transmitted. A high order host who received this Request to Send starts transmission of a print-data group concerning a previous printing demand. And print data received at the printer side are inputted into a print-data treating part one by one, and are processed.

[0015]In the invention according to claim 2, a sequence control means has taken composition of giving prescribed ranking beforehand defined as an acquired priority, when a MAC Address extracted from a printing request packet is not registered into a priority level table.

[0016]In this invention, in a priority level table, even when a priority of a high order host who performed a printing demand is not set up, a default priority set up beforehand is given and processing of a printing demand is made based on the priority concerned.

[0017]In the invention according to claim 3, a sequence control means has taken composition of having a table management department which makes setting out or change of an addition of a MAC Address or deletion, and a priority according to an external signal to a priority level table.

[0018]In this invention, a table management department which received operation of a change-request packet from a high order host, a configuration switch, etc. makes setting out or change of an addition of a MAC Address or deletion, and a priority to a priority level table according to the external signal concerned, for example.

[0019]It is going to attain the purpose mentioned above by these.

[0020]

[Embodiment of the Invention]Hereafter, one embodiment of this invention is described based on drawing 1 thru/or drawing 3.

[0021]The network printer shown in drawing 1 is provided with the data type discrimination section 4 which extracts a printing data packet and a printing request packet from the data packet received by the transmission and reception means 200 which sends and receives a data packet among high order hosts (graphic display abbreviation), and this transmission and reception means 200. It has the priority level table 6 which set up the printing priority for every MAC Address of a high order host, and the queue table 11 which registers the printing demand from a high order host by a predetermined priority. Furthermore, The MAC Address of the high order host who is a transmitting agency is extracted from the printing request packet extracted by the data type discrimination section 4, A sequence control means 100 to acquire the printing priority corresponding to the extracted MAC Address from the priority level table 6, and to register the MAC Address of the high order host concerned into the queue table 11 according to the acquired priority is provided. In addition, the print-data treating part 13 which carries out sequential processing of the printing data packet extracted by the data type discrimination section 4, and carries out a printout, The print-data treating part's 13 completion of processing of the printing data packet group corresponding to one printing demand is provided with the Request-to-Send part 12 which replies a Request-to-Send packet by making into a reply place the MAC Address registered into the head of the queue table 11.

[0022]Among these, the sequence control means 100 gives the prescribed ranking defined beforehand as above-mentioned "acquired priority", when the MAC Address extracted from the printing request packet is not registered into the priority level table 6.

[0023]The sequence control means 100 is provided with the table management department 5 which makes setting out or change of the addition of a MAC Address or deletion, and a priority according to a high order host's demand to the priority level table 6.

[0024]If this is explained further in full detail, the transmission and reception means 200 will be provided with the following in this embodiment.

LAN and the I/O interface 1 which is connected with two or more high order hosts via Ethernet (graphic display abbreviation), and was connected with the network transmission way

The data packet receive section 2 which receives a data packet from this interface 1.

The data packet transmission section 3 which inputs the data packet for transmission into the interface 1.

[0025]The sequence control means 100 is provided with the following.
The transmitting agency MAC Address acquisition part 7 in which at least transmitting Motogami acquires a host's MAC Address from a printing request packet in addition to the table management department 5 mentioned above.
The registration existence check part 8 which gives as a priority the prescribed ranking set up beforehand when this MAC Address becomes a printing priority and a pair, checks whether it registers with the priority level table 6, and is registered, and an applicable priority is acquired and it is not registered.
The packet generation part 9 with a priority which adds the information on the priority acquired from the priority level table 6 to a printing request packet, The queue table updating section 10 which registers the MAC Address of the high order host who had the printing demand in the queue table 11 according to the priority indicated to this packet is provided.
[0026]On the other hand in this embodiment, a high order host shall transmit change-request ** printing request packet, ** printing data packet, or the packet of ** priority level table. Among these, it shall be transmitted as conditions that ** printing data packet received the Request to Send from the network printer. Here, the change-request packet of ** priority level table means the packet for directing Make Changes of the priority level table 6 in the table management department 5.
[0027]Next, operation by this whole embodiment is explained based on drawing 2 thru/or drawing 3.
[0028]The data packet transmitted by the high order host is received via the LANI/O interface 1 of a printer in the data packet receive section 2 (Step S1 of drawing 2). As for the received data packet, it is distinguished over the data type discrimination section 4 whether it is a printing data packet (Step S2). As a result, if it is a printing data packet, it will be transmitted to the print-data treating part 13, and will be processed (Step S3).
[0029]On the other hand, when there is nothing at a printing data packet, it is distinguished whether it is the Make Changes request packet of the MAC address table 6 (step S4). As a result, if it is the Make Changes request packet of the MAC address table 6, renewal of correction of the contents of the priority level table 6 in which the received data is already created over the table management department 5 will be carried out (Step S5).
[0030]On the other hand, when it is not the Make Changes request packet of the MAC address table 6, either, it is judged as a printing request packet and the transmitting agency MAC Address of the data packet received by the transmitting agency MAC Address acquisition part 7 is extracted (Step S6).
[0031]Here, a MAC Address is 6 bytes of peculiar physical address given to all the network connection apparatus containing a high order host, a printer, etc., and the overlapping address does not exist. According to this embodiment, the existing MAC Address is used as a high

order host's identification code.

[0032]Then, the MAC Address from which the registration existence check part 8 was acquired at Step S6 judges whether it registers with the priority level table 6 (Step S7, S8). As a result, when registering with the priority level table 6, the registration existence check part 8 acquires a priority code from the priority level table 6 (step S9). The priority code acquired in step S9 is added to packet information by the packet generation part 9 with a priority (Step S10).

[0033]On the other hand, when the acquisition MAC Address is not registered into the priority level table 6 at Step S8, Intact arbitrary fixed values (**** defines 0 as drawing 6 as an example) are added to packet information as a priority code with the priority level table 6 by the packet generation part 9 with a priority (Step S11).

[0034]And renewal of the queue table 11 is performed by the packet information generated by the queue table updating section 10 by the packet generation part 9 with a priority.

[0035]First, the queue table 11 before updating is referred to (Step S12 of drawing 3), and comparison distinction of whether the queuing data of the same priority exists is carried out (Step S13). As a result, when the queuing data of the same priority exists, the queue table updating section 10 registers a new printing demand into the tail end of a queuing group with an equal priority (Step S14). On the other hand, when the queuing data of the same priority does not exist, the queue table updating section 10 distinguishes whether the queuing data in which ranking is higher than the priority added at Step S11 exists (Step S15).

[0036]As a result, since a new printing demand turns into a demand of highest order when the high queuing data of a priority does not exist, this is registered into the 1st of waiting order, and a queue table is updated (Step S16). On the other hand, when the high queuing data of a priority exists, the queuing group of the priority on one rank is searched (Step S17). As a result, since the waiting order of a new printing demand will come under one rank rather than groups involved if the group on one rank exists, a new printing demand is registered into the tail end of the group of a priority who detected at Step S17, and a table is updated (Step S18). The queue table 11 is updated by the above processing.

[0037]And if the print-data processing by the print-data treating part 13 is completed, in order that that may be reported to the Request-to-Send part 12 and may carry out reception of the following new print data, the Request-to-Send part 12, From the waiting order No. (head) 1 of the updated queue table 11, a high order host's MAC address information is acquired, and it is reported that print data are ability ready for receiving.

[0038]

[Example]Next, one example of the above-mentioned embodiment is described based on drawing 4 thru/or drawing 7.

[0039]In drawing 4, the network printer 41 is connected with two or more host A_1 - A_8, B, and C via the transmission line. Here, the network printer 41 is constituted identically to the

embodiment mentioned above.
It has the priority level table 6 and the queue table 11.

[0040]Among these, the priority level table 6 is constituted as shown in drawing 5. That is, MAC Address 22 of host A_1 - A_8 is registered, respectively, and the priority 21 which should perform a printing job for every MAC Address of that is registered. Here, even if the priority 21 overlaps in the MAC Address of 1, and other MAC Addresses, it does not interfere.
[0041]On the other hand, the queue table 11 is constituted as shown in drawing 6. That is, MAC Address 33 of a host with a printing demand, the priority 32 of the printing job given to this MAC Address, and the communications protocol 34 with the host who has the MAC Address concerned are registered into the high order of the priority from the earlier one of waiting order as a lot. About the hosts B and C who have a MAC Address which is not registered into the priority level table 6, "0" which is a priority which shows the lowest is added by the packet generation part 9 with a priority of drawing 1.
[0042]Drawing 7 shows the composition of a data packet. Between a high order host and the transmission and reception means 200 of drawing 1, drawing 7 (a) is the composition of the packet exchanged, and 6 bytes of destination MAC address, Similarly it comprises a transmitting agency MAC Address of 6 bytes, and predetermined data (data length is variable), and has become the format based on a standard. On the other hand, drawing 7 (b) is the composition of the packet outputted from the packet generation part 9 with a priority, and 1 byte of priority code was added between the transmitting agency MAC Address of the receive packet shown in drawing 7 (a), and data.
[0043]Next, operation of this example is explained based on drawing 1 thru/or drawing 7.
[0044]Now, the printing demand shall be registered into the queue table 11 to the 9th of the waiting order 34 (drawing 6). The print-data treating part 13 presupposes that it is during processing of print data. Here, if the data packet of a printing demand is newly transmitted from the host C46 to the printer 41, the flow chart of drawing 2 will receive a packet at Step S1 first. Then, by judgment of Step S2, since this is not print data, it changes to step S4.
[0045]Since it is not a change request of a priority level table, it changes to Step S6. Then, although it distinguishes whether it registers with the priority level table 6 at Step S8, Since the host's C46 MAC Address is unregistered (drawing 5), it changes to Step S11 and the packet of drawing 7 (b) to which the priority 0 which shows the lowest by the packet generation part 9 with a priority was added is generated.
[0046]Next, renewal of the queue table 11 is performed.
[0047]That is, it is searched [of the same priority] by the queue table 11 of drawing 6 in Step S13 whether queuing data existence is recognized. Now, the priority 0 exists from the waiting order 3 to the waiting order 9. Then, it changes to Step S14 and the printing demand from the

host C is registered into the 10th waiting order (tail end) of the queue table 11 shown in drawing 6.

[0048]

[Effect of the Invention]In this invention, it is constituted as mentioned above and functions. Therefore, since according to this the priority of printing is set up for every MAC Address of a high order host and a sequence control means specifies the priority of printing from the transmitting agency MAC Address of a Request-to-Send packet, The printout according to a priority can be performed without adding change to the existing Network OS.

Since a Request-to-Send part replies a Request to Send to the MAC Address which checks completion of data processing in a print-data treating part, and is registered into the head of the queue table, The buffer which spools the data concerned in connection with the prioritization of data processing can be made unnecessary, and cost reduction can be planned.

[0049]Since a sequence control means gives the predetermined priority set up beforehand in the invention according to claim 2 to the MAC Address into which a printing priority is not registered, Even when a printing demand is received from the upper device which has a MAC Address to which a priority is not set, processing according to the priority of the print data concerning the Request to Send concerned can be performed.

[0050]In the invention according to claim 3, since a table management department makes setting out or change of the addition of a MAC Address or deletion, and a priority to a priority level table according to an external signal, Even when the high order host connected to a network is changed, it can respond to change of a system flexibly, The outstanding network printer which is not in the former that the request of the user who would like to change the priority of printing with print data can also be met can be provided.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention]This invention relates to a network printer and relates to the network printer which processes the printing demand from an upper device especially according to the priority set up beforehand.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a block diagram showing the composition of one embodiment of this invention.
[Drawing 2]It is a preceding paragraph flow chart which shows operation of the embodiment shown in drawing 1.
[Drawing 3]It is a latter-part flow chart which shows operation of the embodiment shown in drawing 1.
[Drawing 4]It is a block diagram showing one example of the embodiment shown in drawing 1.
[Drawing 5]It is a lineblock diagram showing the contents of the priority level table in the example of drawing 4.
[Drawing 6]It is a lineblock diagram showing the contents of the queue table in the example of drawing 4.
[Drawing 7]It is a lineblock diagram of a data packet, and drawing 7 (a) shows the usual packet composition sent and received via a transmission line, and drawing 7 (b) shows the output packet of a packet generation part with a priority.
[Drawing 8]It is a block diagram showing the composition of a conventional example.
[Drawing 9]It is a lineblock diagram showing the contents of the ID table in drawing 8.
[Description of Notations]
4 Data type discrimination section
6 Priority level table
11 Queue table
12 Request-to-Send part
13 Print-data treating part
21 Priority
22 MAC Address
41 Network printer

42 - 46 high order host
100 Sequence control means
200 Transmission and reception means

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CLAIMS

[Claim(s)]

[Claim 1]A network printer characterized by what it is [a thing] characterized by comprising the following.

a) A transmission and reception means which sends and receives a data packet between upper devices.

b) A data type discrimination section which extracts a printing data packet and a printing request packet from a data packet received by this transmission and reception means, c) A priority level table which set up a printing priority for every MAC Address of an upper device, d) A queue table which registers a printing demand from an upper device by a predetermined priority, e) Extract a MAC Address of an upper device which is a transmitting agency from a printing request packet extracted by said data type discrimination section, A sequence control means to acquire a printing priority corresponding to an extracted MAC Address from said priority level table, and to register a MAC Address of the upper device concerned into said queue table according to an acquired priority, f) A print-data treating part which carries out sequential processing of the printing data packet extracted by said data type discrimination section, and carries out a printout, g) A Request-to-Send part which will reply a Request-to-Send packet by making into a reply place a MAC Address registered into a head of said queue table if said print-data treating part completes processing of a printing data packet group corresponding to one printing demand.

[Claim 2]The network printer according to claim 1 when said sequence control means is not registered [a MAC Address extracted from said printing request packet] into said priority level table, wherein it gives prescribed ranking beforehand defined as said acquired priority.

[Claim 3]The network printer according to claim 1, wherein said sequence control means is provided with a table management department which makes setting out or change of an addition of a MAC Address or deletion, and a priority according to an external signal to said priority level table.

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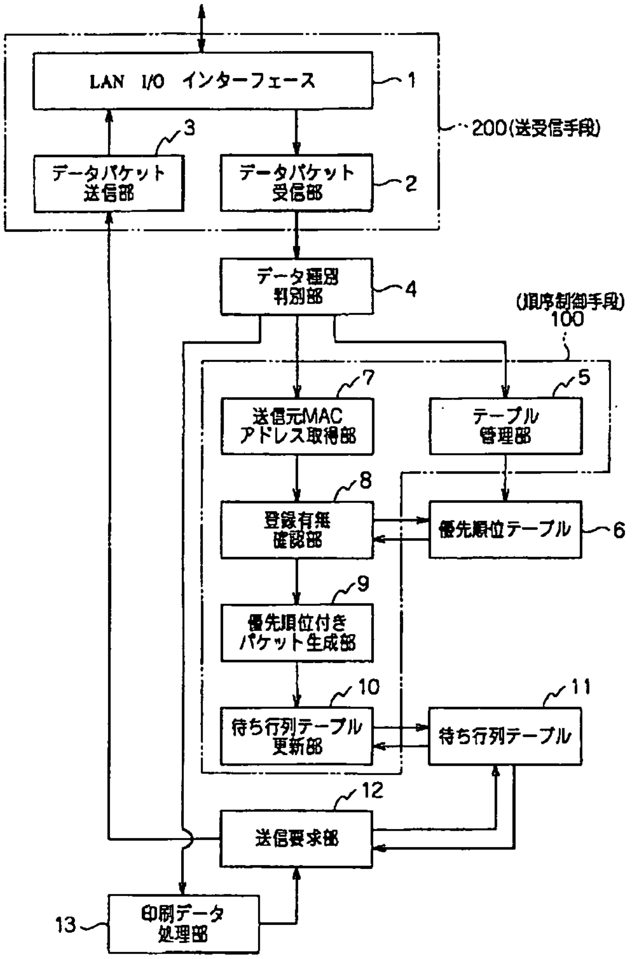
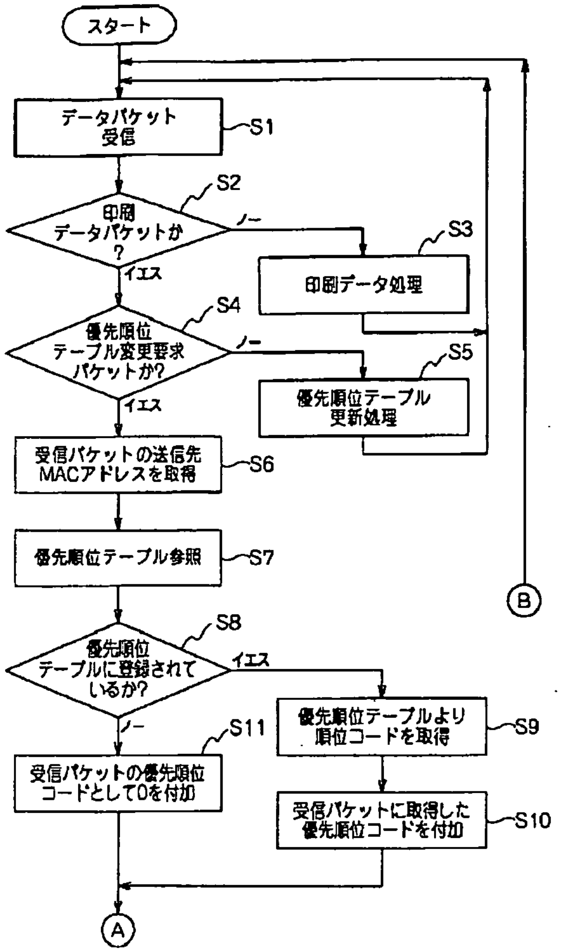
DRAWINGS

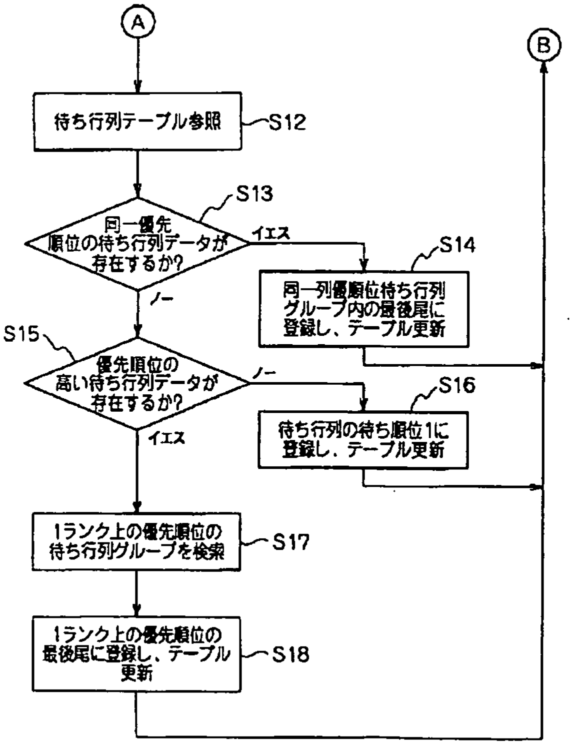
[Drawing 1]



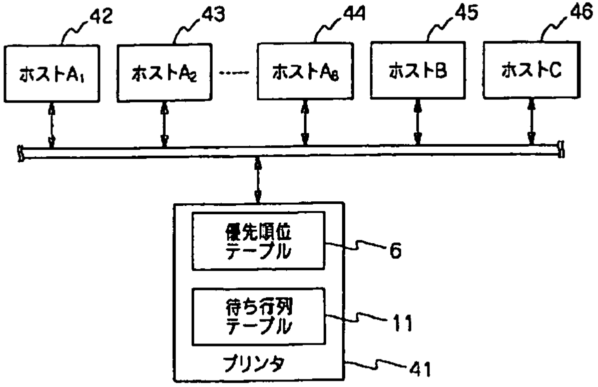
[Drawing 2]


スタート
データパケット受信
S1
S2
印刷データパケットか?
ノー
S3
印刷データ処理
イエス
S4
優先順位テーブル変更要求パケットか?
ノー
S5
優先順位テーブル更新処理
イエス
受信パケットの送信先MACアドレスを取得
S6
優先順位テーブル参照
S7
B
S8
優先順位テーブルに登録されているか?
イエス
優先順位テーブルより順位コードを取得
S9
ノー
S11
受信パケットの優先順位コードとして0を付加
受信パケットに取得した優先順位コードを付加
S10
A

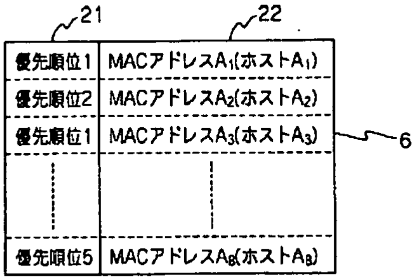
[Drawing 3]


A
B
待ち行列テーブル参照
S12
S13
同一優先順位の待ち行列データが存在するか?
イエス
S14
同一列優順位待ち行列グループ内の最後尾に登録し、テーブル更新
ノー
S15
優先順位の高い待ち行列データが存在するか?
ノー
S16
待ち行列の待ち順位1に登録し、テーブル更新
イエス
1ランク上の優先順位の待ち行列グループを検索
S17
1ランク上の優先順位の最後尾に登録し、テーブル更新
S18

[Drawing 4]

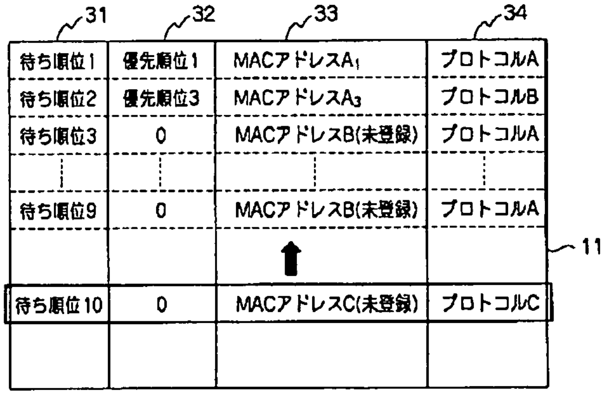


[Drawing 5]



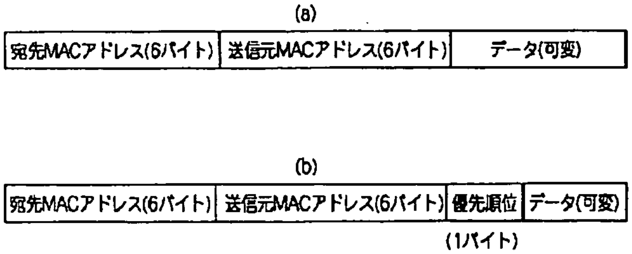
優先順位1	MACアドレスA_1(ホストA_1)
優先順位2	MACアドレスA_2(ホストA_2)
優先順位1	MACアドレスA_3(ホストA_3)
⋮	⋮
優先順位5	MACアドレスA_8(ホストA_8)

[Drawing 6]


31
32
33
34
11

待ち順位1	優先順位1	MACアドレスA_1	プロトコルA
待ち順位2	優先順位3	MACアドレスA_3	プロトコルB
待ち順位3	0	MACアドレスB(未登録)	プロトコルA
⋮	⋮	⋮	⋮
待ち順位9	0	MACアドレスB(未登録)	プロトコルA
		↑	
待ち順位10	0	MACアドレスC(未登録)	プロトコルC

[Drawing 7]



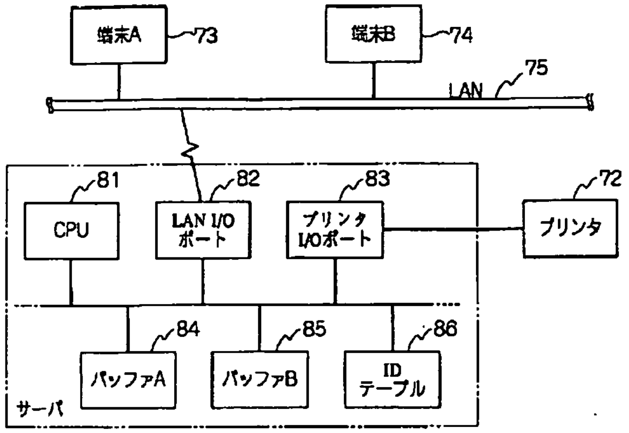
(a)

宛先MACアドレス(6バイト)	送信元MACアドレス(6バイト)	データ(可変)

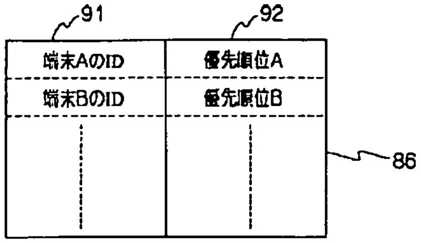
(b)

宛先MACアドレス(6バイト)	送信元MACアドレス(6バイト)	優先順位 (1バイト)	データ(可変)

[Drawing 8]



[Drawing 9]



端末AのID	優先順位A
端末BのID	優先順位B

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EFFECT OF THE INVENTION

[Effect of the Invention]In this invention, it is constituted as mentioned above and functions. Therefore, since according to this the priority of printing is set up for every MAC Address of a high order host and a sequence control means specifies the priority of printing from the transmitting agency MAC Address of a Request-to-Send packet, The printout according to a priority can be performed without adding change to the existing Network OS.
Since a Request-to-Send part replies a Request to Send to the MAC Address which checks completion of data processing in a print-data treating part, and is registered into the head of the queue table, The buffer which spools the data concerned in connection with the prioritization of data processing can be made unnecessary, and cost reduction can be planned.

[0049]Since a sequence control means gives the predetermined priority set up beforehand in the invention according to claim 2 to the MAC Address into which a printing priority is not registered, Even when a printing demand is received from the upper device which has a MAC Address to which a priority is not set, processing according to the priority of the print data concerning the Request to Send concerned can be performed.
[0050]In the invention according to claim 3, since a table management department makes setting out or change of the addition of a MAC Address or deletion, and a priority to a priority level table according to an external signal, Even when the high order host connected to a network is changed, it can respond to change of a system flexibly, The outstanding network printer which is not in the former that the request of the user who would like to change the priority of printing with print data can also be met can be provided.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]However, if it was in the above-mentioned conventional example, there was the following inconvenience.
[0010]Since the 1st had to define user ID as every terminal (high order host) and each terminal had to add the ID to data, the existing general-purpose Network OS could not be used as it was, but it was in charge of operation-ization and there was inconvenience accompanied by change of Network OS.
[0011]Since the 2nd needed to form two or more buffers according to the division numbers of a priority, regardless of the frequency in use of a buffer, the required storage capacity (memory) had to be secured beforehand, and there was inconvenience which invites a high cost.
[0012]
[Objects of the Invention]This invention, without improving the inconvenience which this conventional example has and being especially accompanied by no change of the existing general-purpose Network OS, The printing demand from two or more servers or terminals (user) can be processed according to the priority set up beforehand, and it sets it as the purpose to provide the network printer which does not need the buffer which spools the data concerned in connection with the prioritization of data.

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PRIOR ART

[Description of the Prior Art]The conventional example indicated to JP,4-79638,A is shown in drawing 8 and drawing 9.
[0003]The network printer system shown in drawing 8 comprises the print server 71 which spools the print data transmitted from the terminal A equivalent to a high order host, and the terminals B and these terminals to internal buffer A and B, and the printer 72 which carries out the printout of the spooled data.
[0004]Among these, CPU81 in which the print server 71 manages control of the whole print server, The LANI/O port 82 which manages the interface of LAN75 and controls the data input/output between LAN75, Printer I/O Port 83 which manages an interface with the printer 72, It comprises ID table 86 including the priority 92 of printing set up for every user ID of the buffer A which saves data (ranking A) with a high printing priority as cue, the buffer B which saves data (ranking B) with a low printing priority as cue, and each terminal, and ID concerned.

[0005]Here, as shown in drawing 9, ID91 of the user who uses each terminal, and the priority 92 of printing given to the ID are beforehand registered into ID table 86 as a pair. The print data of the high ranking A of a priority are stored in the buffer A, and the print data of the low-priority ranking B are stored in the buffer B. That is, it is possible to fluctuate the number of the printing priorities which can be treated according to the number of the buffers to form.
[0006]And when performing printing from the terminal A73, the terminal A73 transmits the user ID corresponding to the terminal A73 to the print server 71 with print data. The print server 71 specifies a printing priority corresponding from the user ID which received with reference to ID table 86. When the priority over the terminal A is the ranking A here, the received print data are spooled to the buffer A84 in the print server 71.
[0007]Similarly, when printing is performed from the terminal B74, in addition to print data, the user ID of the terminal B is transmitted to the print server 71. When the priority corresponding

to this ID is the ranking B, the print server 71 spools the received print data to the buffer B85.
[0008]The print server 71 checks whether print data exist in the high buffer A84 of a priority first in a printing job. When print data exist in the buffer A84, data is sucked up in the spooled turn and data is transmitted to the printer 72 via printer I/O Port 83. Since the data from the terminal 73A is held now at the buffer A84, printing from the terminal A has priority and is outputted. When all the data spooled or print data did not exist in the buffer A84 carries out the completion of transmitting at the printer 72, the print server 71 checks whether print data exist in the low-priority buffer B85. Since the print data from the terminal B74 are held now, print data are sucked up from the buffer B85, and it is transmitted to the printer 72 via printer I/O Port 83.

[Translation done.]

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MEANS

[Means for Solving the Problem]a transmission and reception means send and receive a data packet between a upper devices in the invention according to claim 1 in order to attain the above-mentioned purpose, and b -- it has a data type discrimination section which extracts a printing data packet and a printing request packet from a data packet received by this transmission and reception means. It has a priority level table which set up a printing priority for every MAC Address of c upper device, and a queue table which registers a printing demand from d upper device by a predetermined priority. Furthermore, e) Extract a MAC Address of an upper device which is a transmitting agency from a printing request packet extracted by a data type discrimination section, It has a sequence control means to acquire a printing priority corresponding to an extracted MAC Address from a priority level table, and to register a MAC Address of the upper device concerned into a queue table according to an acquired priority. In addition, a print-data treating part which carries out sequential processing of the printing data packet extracted by f data type discrimination section, and carries out a printout, g) A print-data treating part's completion of processing of a printing data packet group corresponding to one printing demand has taken composition of having a Request-to-Send part which replies a Request-to-Send packet by making into a reply place a MAC Address registered into a head of a queue table.

[0014]In this invention, when a printing request packet is received from a high order host, based on a transmitting agency MAC Address of the packet, a priority of a printing job to the printing demand concerned is specified, A MAC Address of a high order host who performed a printing demand according to the priority is registered into a queue table one by one. And whenever processing of a print-data group corresponding to a printing demand of 1 is completed by a print-data treating part, a printing demand is read sequentially from a head of a queue table, and a high order host who has an applicable MAC Address is notified of a Request to Send of a purport that print data should be transmitted. A high order host who received this Request to Send starts transmission of a print-data group concerning a previous printing demand. And print data received at the printer side are inputted into a print-data treating part one by one, and are processed.

[0015]In the invention according to claim 2, a sequence control means has taken composition of giving prescribed ranking beforehand defined as an acquired priority, when a MAC Address extracted from a printing request packet is not registered into a priority level table.

[0016]In this invention, in a priority level table, even when a priority of a high order host who performed a printing demand is not set up, a default priority set up beforehand is given and processing of a printing demand is made based on the priority concerned.

[0017]In the invention according to claim 3, a sequence control means has taken composition of having a table management department which makes setting out or change of an addition of a MAC Address or deletion, and a priority according to an external signal to a priority level table.

[0018]In this invention, a table management department which received operation of a change-request packet from a high order host, a configuration switch, etc. makes setting out or change of an addition of a MAC Address or deletion, and a priority to a priority level table according to the external signal concerned, for example.

[0019]It is going to attain the purpose mentioned above by these.

[0020]

[Embodiment of the Invention]Hereafter, one embodiment of this invention is described based on drawing 1 thru/or drawing 3.

[0021]The network printer shown in drawing 1 is provided with the data type discrimination section 4 which extracts a printing data packet and a printing request packet from the data packet received by the transmission and reception means 200 which sends and receives a data packet among high order hosts (graphic display abbreviation), and this transmission and reception means 200. It has the priority level table 6 which set up the printing priority for every MAC Address of a high order host, and the queue table 11 which registers the printing demand from a high order host by a predetermined priority. Furthermore, The MAC Address of the high order host who is a transmitting agency is extracted from the printing request packet extracted by the data type discrimination section 4, A sequence control means 100 to acquire the printing priority corresponding to the extracted MAC Address from the priority level table 6, and to register the MAC Address of the high order host concerned into the queue table 11 according to the acquired priority is provided. In addition, the print-data treating part 13 which carries out sequential processing of the printing data packet extracted by the data type discrimination section 4, and carries out a printout, The print-data treating part's 13 completion of processing of the printing data packet group corresponding to one printing demand is provided with the Request-to-Send part 12 which replies a Request-to-Send packet by making into a reply place the MAC Address registered into the head of the queue table 11.

[0022]Among these, the sequence control means 100 gives the prescribed ranking defined beforehand as above-mentioned "acquired priority", when the MAC Address extracted from the printing request packet is not registered into the priority level table 6.

[0023]The sequence control means 100 is provided with the table management department 5 which makes setting out or change of the addition of a MAC Address or deletion, and a priority according to a high order host's demand to the priority level table 6.

[0024]If this is explained further in full detail, the transmission and reception means 200 will be provided with the following in this embodiment.

LAN and the I/O interface 1 which is connected with two or more high order hosts via Ethernet (graphic display abbreviation), and was connected with the network transmission way

The data packet receive section 2 which receives a data packet from this interface 1.

The data packet transmission section 3 which inputs the data packet for transmission into the interface 1.

[0025]The sequence control means 100 is provided with the following.

The transmitting agency MAC Address acquisition part 7 in which at least transmitting Motogami acquires a host's MAC Address from a printing request packet in addition to the table management department 5 mentioned above.

The registration existence check part 8 which gives as a priority the prescribed ranking set up beforehand when this MAC Address becomes a printing priority and a pair, checks whether it registers with the priority level table 6, and is registered, and an applicable priority is acquired and it is not registered.

The packet generation part 9 with a priority which adds the information on the priority acquired from the priority level table 6 to a printing request packet, The queue table updating section 10 which registers the MAC Address of the high order host who had the printing demand in the queue table 11 according to the priority indicated to this packet is provided.

[0026]On the other hand in this embodiment, a high order host shall transmit change-request ** printing request packet, ** printing data packet, or the packet of ** priority level table. Among these, it shall be transmitted as conditions that ** printing data packet received the Request to Send from the network printer. Here, the change-request packet of ** priority level table means the packet for directing Make Changes of the priority level table 6 in the table management department 5.

[0027]Next, operation by this whole embodiment is explained based on drawing 2 thru/or drawing 3.

[0028]The data packet transmitted by the high order host is received via the LANI/O interface 1 of a printer in the data packet receive section 2 (Step S1 of drawing 2). As for the received data packet, it is distinguished over the data type discrimination section 4 whether it is a printing data packet (Step S2). As a result, if it is a printing data packet, it will be transmitted to the print-data treating part 13, and will be processed (Step S3).

[0029]On the other hand, when there is nothing at a printing data packet, it is distinguished whether it is the Make Changes request packet of the MAC address table 6 (step S4). As a result, if it is the Make Changes request packet of the MAC address table 6, renewal of correction of the contents of the priority level table 6 in which the received data is already created over the table management department 5 will be carried out (Step S5).

[0030]On the other hand, when it is not the Make Changes request packet of the MAC address table 6, either, it is judged as a printing request packet and the transmitting agency MAC Address of the data packet received by the transmitting agency MAC Address acquisition part 7 is extracted (Step S6).

[0031]Here, a MAC Address is 6 bytes of peculiar physical address given to all the network connection apparatus containing a high order host, a printer, etc., and the overlapping address does not exist. According to this embodiment, the existing MAC Address is used as a high order host's identification code.

[0032]Then, the MAC Address from which the registration existence check part 8 was acquired at Step S6 judges whether it registers with the priority level table 6 (Step S7, S8). As a result, when registering with the priority level table 6, the registration existence check part 8 acquires a priority code from the priority level table 6 (step S9). The priority code acquired in step S9 is added to packet information by the packet generation part 9 with a priority (Step S10).

[0033]On the other hand, when the acquisition MAC Address is not registered into the priority level table 6 at Step S8, Intact arbitrary fixed values (**** defines 0 as drawing 6 as an example) are added to packet information as a priority code with the priority level table 6 by the packet generation part 9 with a priority (Step S11).

[0034]And renewal of the queue table 11 is performed by the packet information generated by the queue table updating section 10 by the packet generation part 9 with a priority.

[0035]First, the queue table 11 before updating is referred to (Step S12 of drawing 3), and comparison distinction of whether the queuing data of the same priority exists is carried out (Step S13). As a result, when the queuing data of the same priority exists, the queue table updating section 10 registers a new printing demand into the tail end of a queuing group with an equal priority (Step S14). On the other hand, when the queuing data of the same priority does not exist, the queue table updating section 10 distinguishes whether the queuing data in which ranking is higher than the priority added at Step S11 exists (Step S15).

[0036]As a result, since a new printing demand turns into a demand of highest order when the high queuing data of a priority does not exist, this is registered into the 1st of waiting order, and a queue table is updated (Step S16). On the other hand, when the high queuing data of a priority exists, the queuing group of the priority on one rank is searched (Step S17). As a result, since the waiting order of a new printing demand will come under one rank rather than groups involved if the group on one rank exists, a new printing demand is registered into the tail end of the group of a priority who detected at Step S17, and a table is updated (Step S18). The queue table 11 is updated by the above processing.

[0037]And if the print-data processing by the print-data treating part 13 is completed, in order that that may be reported to the Request-to-Send part 12 and may carry out reception of the following new print data, the Request-to-Send part 12, From the waiting order No. (head) 1 of the updated queue table 11, a high order host's MAC address information is acquired, and it is reported that print data are ability ready for receiving.

[Translation done.]

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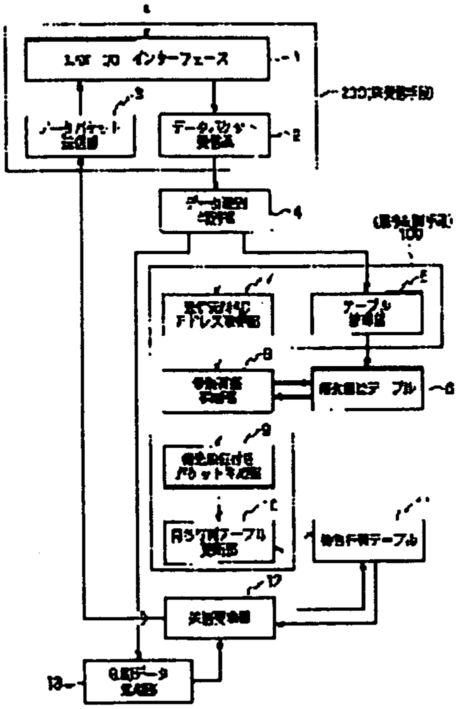
(54) NETWORK PRINTER

(57)Abstract:

PROBLEM TO BE SOLVED: To process a print request according to its priority without modifying a network OS and to eliminate the need for a buffer for print data.

SOLUTION: This network printer is equipped with an order control means 100 which extracts a transmission-destination MAC address from a print request packet, acquires the priority corresponding to it from a priority table 6, and registers the MAC address of a corresponding host device in a queue table 11 according to the obtained priority. Further, this printer is equipped with a request-to-send part 12 which sends a request-to-send packet back to the MAC address at the head of the queue table 11 as a return destination when a print data process part 13 completes a process regarding one print request.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to a network printer and relates to the network printer processed according to the priority which set up the printing demand from high order equipment beforehand especially.
[0002]
[Description of the Prior Art] The conventional example indicated by drawing 8 and drawing 9 at JP,4-79638,A is shown.
[0003] The network printer system shown in drawing 8 consists of a print server 71 which spools the print data transmitted from the terminal A equivalent to a high order host, and Terminals B and these terminals to the internal buffers A and B, and a printer 72 which carries out the printout of the spooled data.
[0004] Among these, CPU81 in which a print server 71 manages control of the whole print server, The LANI/O port 82 which manages an interface with LAN75 and controls the data I/O between LANs75, Printer I/O Port 83 which manages an interface with a printer 72, The buffer A which saves data (ranking A) with high printing priority as a queue Printing priority consists of ID tables 86 including the priority 92 of printing set up for every user ID of Buffer B and each terminal which saves low data (ranking B) as a queue, and ID concerned.
[0005] Here, as shown in drawing 9 , ID91 of the user who uses each terminal, and the priority 92 of printing given to the ID are beforehand registered into the ID table 86 as a pair. Moreover, the print data of the high ranking A of priority are stored in Buffer A, and the print data of the low ranking B of priority are stored in Buffer B. That is, it is possible to fluctuate the number of the printing priority which can be treated according to the number of the buffers to form.
[0006] And when performing printing from a terminal A73, a terminal A73 transmits the user ID corresponding to a terminal A73 to a print server 71 with print data. A print server 71 specifies the printing priority which corresponds from the user ID which received with reference to the ID table 86. When the priority over Terminal A is Ranking A here, the received print data are spooled to the buffer A84 in a print server 71.
[0007] Similarly, when printing is performed from a terminal B74, in addition to print data, the user ID of Terminal B is transmitted to a print server 71. When the priority corresponding to this ID is Ranking B, a print server 71 spools the received print data to a buffer B85.
[0008] A print server 71 checks whether print data exist in the high buffer A84 of priority first in printing processing. When print data exist in a buffer A84, data are sucked up in the spooled sequence and data are transmitted to a printer 72 through printer I/O Port 83. Since the data from terminal 73A are held now at the buffer A84, printing from Terminal A has priority and is outputted. When all the data that print data do not exist or were spooled to the buffer A84 carry out the completion of transmitting at a printer 72, a print server 71 checks whether print data exist in the low buffer B85 of priority. Since the print data from a terminal B74 are held now, print data are sucked up from a buffer B85, and it is

transmitted to a printer 72 through printer I/O Port 83.
[0009]
[Problem(s) to be Solved by the Invention] However, if it was in the above-mentioned conventional example, there was following un-arranging.
[0010] The 1st could not use the existing general-purpose Network OS as it was, but having un-arranged [which is accompanied by modification of Network OS in operation-izing], since user ID had to be defined as every terminal (high order host) and each terminal had to add the ID to data.
[0011] Regardless of the operating frequency of a buffer, having had to secure required storage capacity (memory) beforehand, and having un-arranged [which invites cost quantity], since the 2nd needed to form two or more buffers according to the number of partitions of priority.
[0012]
[Objects of the Invention] This invention improves un-arranging [which this conventional example has], can process the printing demand from two or more servers or terminals (user) according to the priority set up beforehand, without being especially accompanied by no modification of the existing general-purpose Network OS, and sets it as the purpose to offer the network printer which does not need the buffer which spools the data concerned in connection with priority attachment of data.
[0013]
[Means for Solving the Problem] the transceiver means send and receive a data packet between a high order equipment in invention according to claim 1 in order to attain the above-mentioned purpose, and b -- it has the data classification distinction section which extracts a printing data packet and a printing demand packet from the data packet received with this transceiver means. Moreover, it has the priority table which set up printing priority for every MAC Address of c high order equipment, and the queue table which registers the printing demand from d high order equipment by predetermined priority. Furthermore, it has a sequence control means to register the MAC Address of the high order equipment concerned into a queue table according to the priority which acquired the printing priority corresponding to the MAC Address which extracted the MAC Address of the high order equipment which is a transmitting agency, and was extracted from the priority table, and was acquired from the printing demand packet extracted in e data classification distinction section. In addition, if the print-data processing section which processes serially and carries out the printout of the printing data packet extracted in f data classification distinction section, and g print-data processing section complete processing of the printing data packet group corresponding to one printing demand, the configuration of having the Request-to-Send section which answers a letter in a Request-to-Send packet by making into a reply place the MAC Address registered into the head of a queue table is taken.
[0014] In this invention, if a printing demand packet is received from a high order host, based on the transmitting agency MAC Address of the packet, the priority of the printing processing to the printing demand concerned will be specified, and the MAC Address of the high order host who performed the printing demand according to the priority will be serially registered into a queue table. And whenever processing of the print-data group corresponding to the printing demand of 1 is completed by the print-data processing section, a printing demand is read sequentially from the head of a queue table, and the high order host who has the corresponding MAC Address is notified of the Request to Send of a purport which should transmit print data. The high order host who received this Request to Send starts transmission of the print-data group concerning a previous printing demand. And the print data received at the printer side are serially inputted into the print-data processing section, and are processed.
[0015] In invention according to claim 2, the sequence control means has taken the configuration of giving the predetermined ranking beforehand defined as acquired priority, when the MAC Address extracted from the printing demand packet is not registered into a priority table.
[0016] In this invention, in a priority table, even when the priority of the high order host who performed the printing demand is not set up, the default priority set up beforehand is given and processing of a printing demand is made based on the priority concerned.
[0017] In invention according to claim 3, the sequence control means has taken the configuration of having the table Management Department which makes a setup or modification of the addition of a

MAC Address or deletion, and priority according to an external signal to a priority table.

[0018] In this invention, the table Management Department which received actuation of the change-request packet from a high order host, a configuration switch, etc. makes a setup or modification of the addition of a MAC Address or deletion, and priority to a priority table according to the external signal concerned, for example.

[0019] It is going to attain the purpose mentioned above by these.

[0020]

[Embodiment of the Invention] Hereafter, 1 operation gestalt of this invention is explained based on drawing 1 thru/or drawing 3 .

[0021] The network printer shown in drawing 1 is equipped with the data classification distinction section 4 which extracts a printing data packet and a printing demand packet from the data packet received with the transceiver means 200 which sends and receives a data packet among high order hosts (illustration abbreviation), and this transceiver means 200. Moreover, it has the priority table 6 which set up printing priority for every MAC Address of a high order host, and the queue table 11 which registers the printing demand from a high order host by predetermined priority. Furthermore, a sequence control means 100 to register the MAC Address of the high order host concerned into the queue table 11 according to the priority which acquired the printing priority corresponding to the MAC Address which extracted the MAC Address of the high order host who is a transmitting agency, and was extracted from the priority table 6, and was acquired from the printing demand packet extracted in the data classification distinction section 4 is provided. In addition, completion of processing of the printing data packet group corresponding to one printing demand of the print-data processing section 13 which processes serially and carries out the printout of the printing data packet extracted in the data classification distinction section 4, and the print-data processing section 13 is equipped with the Request-to-Send section 12 which answers a letter in a Request-to-Send packet by making into a reply place the MAC Address registered into the head of the queue table 11.

[0022] Among these, the sequence control means 100 gives the predetermined ranking defined beforehand as above-mentioned "acquired priority", when the MAC Address extracted from the printing demand packet is not registered into the priority table 6.

[0023] Moreover, the sequence control means 100 is equipped with the table Management Department 5 which makes a setup or modification of the addition of a MAC Address or deletion, and priority according to a demand of a high order host to the priority table 6.

[0024] If this is explained further in full detail, in this operation gestalt, it connects with two or more high order hosts through Ethernet (illustration abbreviation), and the transceiver means 200 is equipped with LAN and the I/O interface 1 connected with the network transmission line, the data packet receive section 2 which receives a data packet from this interface 1, and the data packet transmitting section 3 which inputs the data packet for transmission into an interface 1.

[0025] Moreover, the transmitting agency MAC Address acquisition section 7 which acquires a transmitting agency high order host's MAC Address from a printing demand packet in addition to the table Management Department 5 which mentioned the sequence control means 100 above, It checks whether this MAC Address becomes printing priority and a pair, and it registers with the priority table 6, when registered, the corresponding priority is acquired, and when not registered, it has the registration existence check section 8 which gives as priority the predetermined ranking set up beforehand. Furthermore, the packet generation section 9 with priority which adds the information on the priority acquired from the priority table 6 to a printing demand packet, and the renewal section 10 of a queue table which registers the MAC Address of the high order host who had the printing demand in the queue table 11 according to the priority indicated by this packet are provided.

[0026] It shall be transmitted as conditions that the high order host should transmit ** printing demand packet, ** printing data packet, or the change-request packet of ** priority table in this operation gestalt, among these ** printing data packet received the Request to Send from the network printer on the other hand. Here, the change-request packet of ** priority table means the packet for directing Make Changes of the priority table 6 to the table Management Department 5.

[0027] Next, actuation by this whole operation gestalt is explained based on drawing 2 thru/or drawing 3 .

[0028] The data packet transmitted by the high order host is received through the LANI/O interface 1 of a printer in the data packet receive section 2 (step S1 of drawing 2). As for the received data packet, it is distinguished over the data classification distinction section 4 whether it is a printing data packet (step S2). Consequently, if it is a printing data packet, it will be transmitted to the print-data processing section 13, and will be processed (step S3).

[0029] On the other hand, when there is nothing at a printing data packet, it is distinguished whether it is the Make Changes demand packet of the MAC address table 6 (step S4). Consequently, if it is the Make Changes demand packet of the MAC address table 6, the received data will be crossed to the table Management Department 5, and renewal of correction of the contents of the priority table 6 already created will be carried out (step S5).

[0030] On the other hand, when it is not the Make Changes demand packet of the MAC address table 6, either, it is judged as a printing demand packet and the transmitting agency MAC Address of the data packet received by the transmitting agency MAC Address acquisition section 7 is extracted (step S6).

[0031] Here, a MAC Address is 6 bytes of proper physical address given to all the network connection equipments containing a high order host, a printer, etc., and the overlapping address does not exist. With this operation gestalt, the existing MAC Address is used as a high order host's identification code.

[0032] Then, the MAC Address from which the registration existence check section 8 was acquired at step S6 judges whether it registers with the priority table 6 (steps S7 and S8). Consequently, when registering with the priority table 6, the registration existence check section 8 acquires a priority code from the priority table 6 (step S9). The priority code acquired in step S9 is added to packet information by the packet generation section 9 with priority (step S10).

[0033] On the other hand, when the acquisition MAC Address is not registered into the priority table 6 at step S8, the intact fixed value (**** defines 0 as drawing 6 as an example) of arbitration is added to packet information as a priority code on the priority table 6 by the packet generation section 9 with priority (step S11).

[0034] And renewal of the queue table 11 is performed by the packet information generated in the packet generation section 9 with priority by the renewal section 10 of a queue table.

[0035] First, the queue table 11 before updating is referred to (step S12 of drawing 3), and comparison distinction of whether the queue data of the same priority exist is carried out (step S13). Consequently, when the queue data of the same priority exist, the renewal section 10 of a queue table registers a new printing demand into the tail end of a queue group with equal priority (step S14). On the other hand, when the queue data of the same priority do not exist, the renewal section 10 of a queue table distinguishes whether queue data with ranking higher than the priority added at step S11 exist (step S15).

[0036] Consequently, since a new printing demand turns into a demand of the highest ranking when the high queue data of priority do not exist, this is registered into the 1st of waiting ranking, and a queue table is updated (step S16). On the other hand, when the high queue data of priority exist, the queue group of the priority on one rank is searched (step S17). Consequently, if the group on one rank exists, since the waiting ranking of a new printing demand will become the bottom of one rank from groups involved, a new printing demand is registered into the tail end of the group of priority who detected at step S17, and a table is updated (step S18). The queue table 11 is updated by the above processing.

[0037] And if print-data processing in the print-data processing section 13 is completed, in order that that may be reported to the Request-to-Send section 12 and may carry out reception of the following new print data, from the waiting ranking of No. 1 (head) of the updated queue table 11, the Request-to-Send section 12 acquires a high order host's MAC Address information, and notifies that print data are ability ready for receiving.

[0038]

[Example] Next, one example of the above-mentioned operation gestalt is explained based on drawing 4 thru/or drawing 7 .

[0039] In drawing 4 , the network printer 41 is connected with two or more host A1 -A8, B, and C through the transmission line. Here, the network printer 41 is constituted identically to the operation gestalt mentioned above, and is equipped with the priority queue table 6 and 11.

[0040] Among these, the priority table 6 is constituted as shown in drawing 5 . Namely, host A1 -A8 MAC Address 22 is registered, respectively and the priority 21 which should perform printing processing for every MAC Address of that is registered. Here, even if priority 21 overlaps in the MAC Address of 1, and other MAC Addresses, it does not interfere.

[0041] On the other hand, the queue table 11 is constituted as shown in drawing 6 . That is, MAC Address 33 of a host with a printing demand, the priority 32 of the printing processing given to this MAC Address, and the communications protocol 34 with the host who has the MAC Address concerned are registered into the high order of priority from the earlier one of waiting ranking as a lot. Moreover, about the hosts B and C who have the MAC Address which is not registered into the priority table 6, "0" which is the priority which shows the least significant is added by the packet generation section 9 with priority of drawing 1 .

[0042] Drawing 7 shows the configuration of a data packet. Drawing 7 (a) is the configuration of the packet exchanged between a high order host and the transceiver means 200 of drawing 1 , consists of a transmitting agency MAC Address of 6 bytes, and predetermined data (a data length is adjustable) as well as 6 bytes of destination MAC Address, and serves as a format based on specification. On the other hand, drawing 7 (b) is the configuration of the packet outputted from the packet generation section 9 with priority, and 1 byte of priority code was added between the transmitting agency MAC Address of the receive packet shown in drawing 7 (a), and data.

[0043] Next, actuation of this example is explained based on drawing 1 thru/or drawing 7 .

[0044] Now, the printing demand shall be registered into the queue table 11 to the 9th of the waiting ranking 34 (drawing 6). Moreover, the print-data processing section 13 presupposes that print data are processing. Here, if the data packet of a printing demand is newly transmitted from a host C46 to a printer 41, the flow chart of drawing 2 will receive a packet at step S1 first. Then, by decision of step S2, since this is not print data, it changes to step S4.

[0045] Furthermore, since it is not the change request of a priority table, it changes to step S6. Then, although it distinguishes whether it registers with the priority table 6 at step S8, since a host's C46 MAC Address has not registered (drawing 5), it changes to step S11 and the packet of drawing 7 (b) to which the priority 0 which shows the least significant by the packet generation section 9 with priority was added is generated.

[0046] Next, renewal of the queue table 11 is performed.

[0047] That is, it is searched [of the same priority] by the queue table 11 of drawing 6 in step S13 whether queue data existence is recognized. Now, priority 0 exists from the waiting ranking 3 to the waiting ranking 9. Then, it changes to step S14 and the printing demand from Host C is registered into the 10th waiting ranking (tail end) of the queue table 11 shown in drawing 6 .

[0048]
[Effect of the Invention] According to [since this invention is constituted as mentioned above and functions] this, the printout according to priority can be performed, without adding modification to the existing Network OS, since the priority of printing is set up for every MAC Address of a high order host and a sequence control means specifies the priority of printing from the transmitting agency MAC Address of a Request-to-Send packet. Moreover, since the Request-to-Send section answers a letter in a Request to Send to the MAC Address which checks completion of data processing in the print-data processing section, and is registered into the head of a queue table, the buffer which spools the data concerned in connection with priority attachment of data processing can be made unnecessary, and cost reduction can be planned.

[0049] In invention according to claim 2, since a sequence control means gives the predetermined priority set up beforehand to the MAC Address into which printing priority is not registered, even when a printing demand is received from the high order equipment which has the MAC Address to which priority is not set, processing according to the priority of the print data concerning the Request to Send

concerned can be performed.
[0050] In invention according to claim 3, since the table Management Department makes a setup or modification of the addition of a MAC Address or deletion, and priority to a priority table according to an external signal Even when the high order host connected to a network is changed, it can respond to the alteration of a system flexibly. Moreover, the outstanding network printer which is not in the former that the request of the user who wants to change the priority of printing with print data can also be met can be offered.

[Translation done.]

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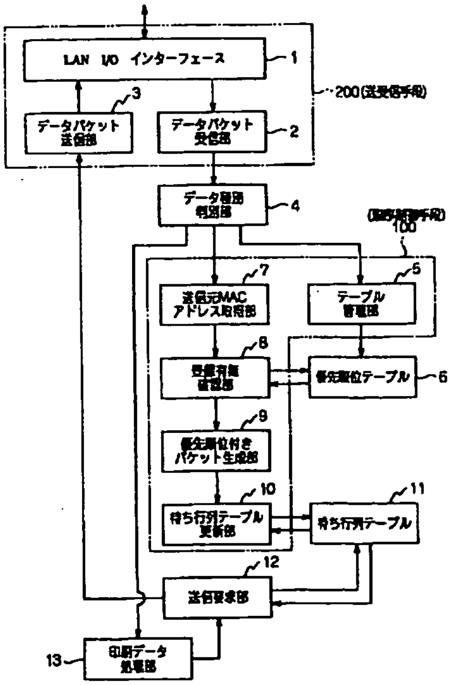
(54)【発明の名称】　ネットワークプリンタ

(57)【要約】

【課題】　ネットワークＯＳを変更せずに、印刷要求を優先順位で処理でき、その際、印刷データのバッファも必要としないこと。

【解決手段】　印刷要求パケットから送信元ＭＡＣアドレスを抽出し、これに対応する印刷優先順位を優先順位テーブル６から取得し、取得した優先順位に応じて待ち行列テーブル１１に当該上位装置のＭＡＣアドレスを登録する順序制御手段１００を備える。更に、印刷データ処理部１３が一つの印刷要求にかかる処理を完了すると、待ち行列テーブル１１の先頭にあるＭＡＣアドレスを返信先として送信要求パケットを返信する送信要求部１２を備える。



【特許請求の範囲】

【請求項１】ａ）上位装置との間でデータパケットの送受を行う送受信手段と、

ｂ）この送受信手段で受信されたデータパケットから印刷データパケットと印刷要求パケットとを抽出するデータ種別判別部と、

ｃ）上位装置のＭＡＣアドレス毎に印刷優先順位を設定した優先順位テーブルと、

ｄ）上位装置からの印刷要求を所定の優先順位で登録する待ち行列テーブルと、

ｅ）前記データ種別判別部で抽出された印刷要求パケットから送信元である上位装置のＭＡＣアドレスを抽出し，抽出したＭＡＣアドレスに対応する印刷優先順位を前記優先順位テーブルから取得し，取得した優先順位に応じて前記待ち行列テーブルに当該上位装置のＭＡＣアドレスを登録する順序制御手段と、

ｆ）前記データ種別判別部で抽出された印刷データパケットを逐次処理して印刷出力する印刷データ処理部と、

ｇ）前記印刷データ処理部が一つの印刷要求に対応する印刷データパケット群の処理を完了すると，前記待ち行列テーブルの先頭に登録されているＭＡＣアドレスを返信先として送信要求パケットを返信する送信要求部と、

を備えていることを特徴としたネットワークプリンタ。

【請求項２】　前記順序制御手段は、前記印刷要求パケットから抽出したＭＡＣアドレスが前記優先順位テーブルに登録されていないときは、前記取得した優先順位として予め定められた所定順位を付与することを特徴とした請求項１記載のネットワークプリンタ。

【請求項３】　前記順序制御手段は、前記優先順位テーブルに対し外部信号に応じて、ＭＡＣアドレスの追加又は削除，優先順位の設定又は変更，を行うテーブル管理部を備えていることを特徴とした請求項１記載のネットワークプリンタ。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、ネットワークプリンタに係り、特に、上位装置からの印刷要求を予め設定した優先順位に従って処理するネットワークプリンタに関する。

【０００２】

【従来の技術】図８及び図９に、特開平４－７９６３８号公報に記載された従来例を示す。

【０００３】図8に示すネットワークプリンタシステムは、上位ホストに相当する端末Ａ、端末Ｂと、これらの端末から送信された印刷データを内部バッファＡ，Ｂにスプールするプリントサーバ７１と、スプールされたデータを印刷出力するプリンタ７２とから構成されている。

【０００４】このうち、プリントサーバ７１は、プリントサーバ全体の制御を司るＣＰＵ８１と、ＬＡＮ７５とのインターフェースを司りＬＡＮ７５との間におけるデータ入出力を制御するＬＡＮＩ／Ｏポート８２と、プリンタ７２とのインターフェースを司るプリンタＩ／Ｏポート８３と、印刷優先順位が高いデータ（順位Ａ）をキューとして保存するバッファＡと、印刷優先順位が低いデータ（順位Ｂ）をキューとして保存するバッファＢと、各端末のユーザＩＤ及び当該ＩＤ毎に設定された印刷の優先順位９２を含むＩＤテーブル８６とから構成されている。

【０００５】ここで、ＩＤテーブル８６には、図9に示すように、各端末を使用するユーザのＩＤ９１と、そのＩＤに付与された印刷の優先順位９２とが対として予め登録されている。また、バッファＡには、優先順位の高い順位Ａの印刷データが格納され、バッファＢには、優先順位の低い順位Ｂの印刷データが格納されるようになっている。即ち、設けるバッファの数に応じて、扱える印刷優先順位の数を増減することが可能となっている。

【０００６】そして、端末Ａ７３から印刷を行う場合、端末Ａ７３は、印刷データと共に端末Ａ７３に対応したユーザＩＤをプリントサーバ７１に対し転送する。プリントサーバ７１は、ＩＤテーブル８６を参照し、受信したユーザＩＤから対応する印刷優先順位を特定する。ここで、端末Ａに対する優先順位が順位Ａである場合、受信した印刷データは、プリントサーバ７１内のバッファＡ８４にスプールされる。

【０００７】同様に、端末Ｂ７４から印刷が行われる場合も、印刷データに加え端末ＢのユーザＩＤがプリントサーバ７１に対して転送される。このＩＤに対応する優先順位が順位Ｂである場合、プリントサーバ７１は、受信した印刷データをバッファＢ８５にスプールする。

【０００８】プリントサーバ７１は、印刷処理において、まず優先順位の高いバッファＡ８４に印刷データが存在するか否かを確認する。バッファＡ８４に印刷データが存在する場合、スプールされた順番にデータを吸い上げ、プリンタＩ／Ｏポート８３を介してプリンタ７２にデータを転送する。今、端末７３Ａからのデータがバッファ８４に保持されているので、端末Ａからの印刷が優先して出力される。バッファＡ８４に印刷データが存在しない、あるいはスプールされたデータが全てプリンタ７２に送信完了した場合、プリントサーバ７１は、優先順位の低いバッファＢ８５に印刷データが存在するか否かを確認する。今、端末Ｂ７４からの印刷データが保持されているので、バッファＢ８５から印刷データが吸い上げられ、プリンタＩ／Ｏポート８３を介してプリンタ７２に転送される。

【０００９】

【発明が解決しようとする課題】しかしながら、上記従来例にあっては、以下の不都合があった。

【００１０】第1は、端末（上位ホスト）毎にユーザＩＤを定義し、各端末がそのＩＤをデータに付加しなけれ

ばならないので、既存の汎用ネットワークＯＳをそのまま利用することができず、実施化にあたりネットワークＯＳの変更を伴う不都合があった。

【００１１】第２は、優先順位の区分数に応じて複数のバッファを設ける必要があるので、バッファの使用頻度とは無関係に必要な記憶容量（メモリ）を予め確保しておかなければならず、コスト高を招来する不都合があった。

【００１２】

【発明の目的】本発明は、かかる従来例の有する不都合を改善し、特に、既存の汎用ネットワークＯＳの変更を一切伴わずに、複数のサーバ又は端末（ユーザ）からの印刷要求を予め設定した優先順位に従って処理でき、データの優先順位付けに伴い当該データをスプールするバッファを必要としないネットワークプリンタを提供することを、その目的とする。

【００１３】

【課題を解決するための手段】上記目的を達成するため、請求項１記載の発明では、ａ）上位装置との間でデータパケットの送受を行う送受信手段と、ｂ）この送受信手段で受信されたデータパケットから印刷データパケットと印刷要求パケットとを抽出するデータ種別判別部とを備えている。また、ｃ）上位装置のＭＡＣアドレス毎に印刷優先順位を設定した優先順位テーブルと、ｄ）上位装置からの印刷要求を所定の優先順位で登録する待ち行列テーブルとを備えている。更に、ｅ）データ種別判別部で抽出された印刷要求パケットから送信元である上位装置のＭＡＣアドレスを抽出し，抽出したＭＡＣアドレスに対応する印刷優先順位を優先順位テーブルから取得し，取得した優先順位に応じて待ち行列テーブルに当該上位装置のＭＡＣアドレスを登録する順序制御手段を備えている。これに加え、ｆ）データ種別判別部で抽出された印刷データパケットを逐次処理して印刷出力する印刷データ処理部と、ｇ）印刷データ処理部が一つの印刷要求に対応する印刷データパケット群の処理を完了すると，待ち行列テーブルの先頭に登録されているＭＡＣアドレスを返信先として送信要求パケットを返信する送信要求部とを備える、という構成を採っている。

【００１４】本発明では、上位ホストから印刷要求パケットを受信すると、そのパケットの送信元ＭＡＣアドレスに基づいて当該印刷要求に対する印刷処理の優先順位が特定され、その優先順位に応じて印刷要求を行った上位ホストのＭＡＣアドレスが待ち行列テーブルに逐次登録されてゆく。そして、印刷データ処理部により一の印刷要求に対応する印刷データ群の処理が完了する毎に、待ち行列テーブルの先頭から順に印刷要求が読み出され、該当するＭＡＣアドレスを有する上位ホストに印刷データを送信すべき旨の送信要求が通知される。この送信要求を受けた上位ホストは、先の印刷要求に係る印刷データ群の送信を開始する。そして、プリンタ側に受信された印刷データは印刷データ処理部に逐次入力され処理される。

【００１５】請求項２記載の発明では、順序制御手段は、印刷要求パケットから抽出したＭＡＣアドレスが優先順位テーブルに登録されていないときは、取得した優先順位として予め定められた所定順位を付与する、という構成を採っている。

【００１６】本発明では、優先順位テーブルにおいて、印刷要求を行った上位ホストの優先順位が設定されていない場合でも、予め設定されたデフォルトの優先順位が付与され、当該優先順位に基づいて印刷要求の処理がなされる。

【００１７】請求項３記載の発明では、順序制御手段は、優先順位テーブルに対し外部信号に応じて、ＭＡＣアドレスの追加又は削除，優先順位の設定又は変更，を行うテーブル管理部を備えている、という構成を採っている。

【００１８】本発明では、例えば、上位ホストからの変更要求パケットや設定スイッチ等の操作を受け付けたテーブル管理部は、当該外部信号に応じて、優先順位テーブルに対しＭＡＣアドレスの追加又は削除，優先順位の設定又は変更を行う。

【００１９】これらにより前述した目的を達成しようとするものである。

【００２０】

【発明の実施の形態】以下、本発明の一実施形態を図１乃至図３に基づいて説明する。

【００２１】図１に示すネットワークプリンタは、上位ホスト（図示略）との間でデータパケットの送受を行う送受信手段２００と、この送受信手段２００で受信されたデータパケットから印刷データパケットと印刷要求パケットとを抽出するデータ種別判別部４とを備えている。また、上位ホストのＭＡＣアドレス毎に印刷優先順位を設定した優先順位テーブル６と、上位ホストからの印刷要求を所定の優先順位で登録する待ち行列テーブル１１とを有する。更に、データ種別判別部４で抽出された印刷要求パケットから送信元である上位ホストのＭＡＣアドレスを抽出し，抽出したＭＡＣアドレスに対応する印刷優先順位を優先順位テーブル６から取得し，取得した優先順位に応じて待ち行列テーブル１１に当該上位ホストのＭＡＣアドレスを登録する順序制御手段１００を具備している。これに加え、データ種別判別部４で抽出された印刷データパケットを逐次処理して印刷出力する印刷データ処理部１３と、印刷データ処理部１３が一つの印刷要求に対応する印刷データパケット群の処理を完了すると，待ち行列テーブル１１の先頭に登録されているＭＡＣアドレスを返信先として送信要求パケットを返信する送信要求部１２とを備えている。

【００２２】このうち、順序制御手段１００は、印刷要求パケットから抽出したＭＡＣアドレスが優先順位テー

ブル6に登録されていないときは、上述の「取得した優先順位」として、予め定められた所定順位を付与するようになっている。

【００２３】また、順序制御手段１００は、優先順位テーブル6に対し上位ホストの要求に応じて、ＭＡＣアドレスの追加又は削除，優先順位の設定又は変更，を行うテーブル管理部5を備えている。

【００２４】これを更に詳述すると、本実施形態において、送受信手段２００は、イーサネットを介して複数の上位ホストと接続されており（図示略）、ネットワーク伝送路と接続されたＬＡＮ・Ｉ／Ｏインターフェース１と、このインターフェース１からデータパケットを受信するデータパケット受信部２と、インターフェース１に送信用のデータパケットを入力するデータパケット送信部3とを備えている。

【００２５】また、順序制御手段１００は、上述したテーブル管理部5に加え、印刷要求パケットから送信元上位ホストのＭＡＣアドレスを取得する送信元ＭＡＣアドレス取得部7と、このＭＡＣアドレスが印刷優先順位と対になって優先順位テーブル６に登録されているか否かを確認し，登録されているときは該当する優先順位を取得し，登録されていない場合は優先順位として，予め設定された所定順位を付与する登録有無確認部8とを有する。更に、優先順位テーブル６から取得された優先順位の情報を印刷要求パケットに付加する優先順位付きパケット生成部９と、このパケットに記載された優先順位に応じて待ち行列テーブル１１に印刷要求のあった上位ホストのＭＡＣアドレスを登録する待ち行列テーブル更新部１０とを具備している。

【００２６】一方、本実施形態において上位ホストは、①印刷要求パケット，②印刷データパケット，③優先順位テーブルの変更要求パケットのいずれかを送信するものとし、このうち、②印刷データパケットは、ネットワークプリンタから送信要求を受信したことを条件として送信されるものとする。ここで、③優先順位テーブルの変更要求パケットとは、テーブル管理部５に優先順位テーブル６の内容変更を指示するためのパケットをいう。

【００２７】次に、本実施形態の全体動作を図２乃至図３に基づいて説明する。

【００２８】上位ホストから送信されたデータパケットは、プリンタのＬＡＮＩ／Ｏインターフェース１を介し、データパケット受信部２で受信される（図２のステップＳ１）。受信されたデータパケットは、データ種別判別部４に渡り、印刷データパケットか否かが判別される（ステップＳ２）。この結果、印刷データパケットであれば、印刷データ処理部１３に転送され処理される（ステップＳ３）。

【００２９】一方、印刷データパケットで無い場合は、ＭＡＣアドレステーブル６の内容変更要求パケットか否かが判別される（ステップＳ４）。この結果、ＭＡＣアドレステーブル６の内容変更要求パケットであれば、受信したデータはテーブル管理部５に渡り、既に作成されている優先順位テーブル６の内容が修正更新される（ステップＳ５）。

【００３０】一方、ＭＡＣアドレステーブル６の内容変更要求パケットでもない場合は、印刷要求パケットと判断され、送信元ＭＡＣアドレス取得部7により、受信されたデータパケットの送信元ＭＡＣアドレスが抽出される（ステップＳ６）。

【００３１】ここで、ＭＡＣアドレスは、上位ホストやプリンタ等を含む全てのネットワーク接続装置に与えられる６バイトの固有物理アドレスであり、重複するアドレスは存在しない。本実施形態では、上位ホストの識別コードとして既存のＭＡＣアドレスを使用する。

【００３２】続いて、登録有無確認部8は、ステップＳ６で取得されたＭＡＣアドレスが優先順位テーブル６に登録されているか否かを判断する（ステップＳ７，Ｓ８）。この結果、優先順位テーブル６に登録されている場合、登録有無確認部8は、優先順位テーブル６より優先順位コードを取得する（ステップＳ９）。ステップＳ９にて取得された優先順位コードは、優先順位付きパケット生成部９によりパケット情報に付加される（ステップＳ１０）。

【００３３】一方、ステップＳ８で優先順位テーブル６に取得ＭＡＣアドレスが登録されていない場合は、優先順位テーブル６で未使用の任意の固定値（図６においては、例として０を定義）が、優先順位コードとして優先順位付きパケット生成部９によりパケット情報に付加される（ステップＳ１１）。

【００３４】そして、待ち行列テーブル更新部１０により、優先順位付きパケット生成部９で生成されたパケット情報により、待ち行列テーブル１１の更新が行われる。

【００３５】まず、更新前の待ち行列テーブル１１が参照され（図３のステップＳ１２）、同じ優先順位の待ち行列データが存在するか否かを比較判別する（ステップＳ１３）。この結果、同一優先順位の待ち行列データが存在する場合、待ち行列テーブル更新部１０は、優先順位が等しい待ち行列群の最後尾に新規印刷要求を登録する（ステップＳ１４）。一方、同一優先順位の待ち行列データが存在しない場合、待ち行列テーブル更新部１０は、ステップＳ１１で付加された優先順位より順位が高い待ち行列データが存在するか否か判別する（ステップＳ１５）。

【００３６】この結果、優先順位の高い待ち行列データが存在しない場合、新規印刷要求が最高順位の要求となるので、これを待ち順位の１番目に登録し、待ち行列テーブルを更新する（ステップＳ１６）。一方、優先順位の高い待ち行列データが存在した場合、１ランク上の優先順位の待ち行列グループを検索する（ステップＳ１

７）。この結果、１ランク上のグループが存在すれば、新規印刷要求の待ち順位は当該グループよりも１ランク下になるので、ステップＳ１７で検出した優先順位のグループの最後尾に新規印刷要求を登録し、テーブルの更新を行う（ステップＳ１８）。以上の処理で待ち行列テーブル１１が更新される。

【００３７】そして、印刷データ処理部１３での印刷データ処理が完了すると、その旨が送信要求部１２に報告され、次の新規印刷データを受信処理する為に、送信要求部１２は、更新された待ち行列テーブル１１の待ち順位１番（先頭）から、上位ホストのＭＡＣアドレス情報を取得し、印刷データが受信可能であることを通知する。

【００３８】

【実施例】次に、上記実施形態の一実施例を図４乃至図７に基づいて説明する。

【００３９】図４において、ネットワークプリンタ４１は、伝送路を介して複数のホストA_1～A_8，Ｂ，Ｃと接続されている。ここで、ネットワークプリンタ４１は、上述した実施形態と同一に構成されており、優先順位テーブル６及び待ち行列テーブル１１を備えている。

【００４０】このうち、優先順位テーブル６は、図５に示すように構成されている。即ち、ホストA_1～A_8のＭＡＣアドレス２２がそれぞれ登録され、その各ＭＡＣアドレス毎に印刷処理を行うべき優先順位２１が登録されている。ここで、優先順位２１は、一のＭＡＣアドレスと他のＭＡＣアドレスとで重複していても差し支えない。

【００４１】一方、待ち行列テーブル１１は、図６に示すように構成されている。即ち、印刷要求のあったホストのＭＡＣアドレス３３と、このＭＡＣアドレスに与えられた印刷処理の優先順位３２と、当該ＭＡＣアドレスを有するホストとの通信プロトコル３４とが一組として、待ち順位の早い方から優先順位の高い順に登録されている。また、優先順位テーブル６に登録されていないＭＡＣアドレスを有するホストＢ，Ｃについては、最下位を示す優先順位である「０」が図１の優先順位付きパケット生成部９により付加されるようになっている。

【００４２】図７は、データパケットの構成を示す。図７（ａ）は、上位ホストと図１の送受信手段２００との間でやり取りされるパケットの構成であって、６バイトの宛先ＭＡＣアドレスと、同じく６バイトの送信元ＭＡＣアドレスと、所定のデータ（データ長は可変）とから構成され、規格に準拠したフォーマットとなっている。一方、図７（ｂ）は、優先順位付きパケット生成部９から出力されるパケットの構成であって、図７（ａ）に示す受信パケットの送信元ＭＡＣアドレスとデータとの間に１バイトの優先順位コードが付加されたものとなっている。

【００４３】次に、本実施例の動作を図１乃至図７に基づいて説明する。

【００４４】現在、待ち行列テーブル１１には、待ち順位３４の９番目まで印刷要求が登録されているものとする（図６）。また、印刷データ処理部１３は、印刷データの処理中であるとする。ここで、ホストＣ４６から新たに印刷要求のデータパケットがプリンタ４１に対して送信されると、図２のフローチャートにより、まず、ステップＳ１でパケットを受信する。続いて、ステップＳ２の判断で、これは印刷データではないのでステップＳ４に遷移する。

【００４５】さらに、優先順位テーブルの変更要求ではないので、ステップＳ６に遷移する。その後、ステップＳ８で優先順位テーブル６に登録されているか否かの判別を行うが、ホストＣ４６のＭＡＣアドレスは未登録なので（図５）、ステップＳ１１に遷移し、優先順位付きパケット生成部９により、最下位を示す優先順位０が付加された図７（ｂ）のパケットが生成される。

【００４６】次に、待ち行列テーブル１１の更新が行われる。

【００４７】即ち、ステップＳ１３において、図６の待ち行列テーブル１１に同一優先順位の待ち行列データ存在するか否かが検索される。今、優先順位０は、待ち順位３から待ち順位９まで存在する。そこで、ステップＳ１４に遷移し、ホストＣからの印刷要求は、図６に示す待ち行列テーブル１１の待ち順位１０番目（最後尾）に登録される。

【００４８】

【発明の効果】本発明は、以上のように構成され機能するので、これによると、上位ホストのＭＡＣアドレス毎に印刷の優先順位を設定し、順序制御手段が、送信要求パケットの送信元ＭＡＣアドレスから印刷の優先順位を特定するので、既存のネットワークＯＳに変更を加えることなく、優先順位に従った印刷出力を行うことができる。また、送信要求部が、印刷データ処理部におけるデータ処理の完了を確認して、待ち行列テーブルの先頭に登録されているＭＡＣアドレスに対し送信要求を返信するので、データ処理の優先順位付けに伴い当該データをスプールするバッファを不要とすることができ、コスト低減を図ることができる。

【００４９】請求項２記載の発明では、順序制御手段が、印刷優先順位の登録されていないＭＡＣアドレスに対し、予め設定された所定の優先順位を付与するので、優先順位の設定されていないＭＡＣアドレスを有する上位装置から印刷要求を受けた場合でも、当該送信要求にかかる印刷データの優先順位に従った処理を行うことができる。

【００５０】請求項３記載の発明では、テーブル管理部が、外部信号に応じて優先順位テーブルに対し、ＭＡＣアドレスの追加又は削除，優先順位の設定又は変更を行うので、ネットワークに接続される上位ホストが変更さ

れた場合でも、システムの改変に柔軟に対応することができ、また、印刷データによって印刷の優先順位を変更したいというユーザーの要望にも応えることができる、という従来にない優れたネットワークプリンタを提供することができる。

【図面の簡単な説明】

【図１】本発明の一実施形態の構成を示すブロック図である。

【図２】図１に示す実施形態の動作を示す前段フローチャートである。

【図３】図１に示す実施形態の動作を示す後段フローチャートである。

【図４】図１に示す実施形態の一実施例を示すブロック図である。

【図５】図４の実施例における優先順位テーブルの内容を示す構成図である。

【図６】図４の実施例における待ち行列テーブルの内容を示す構成図である。

【図７】データパケットの構成図であり、図７（ａ）は伝送路を介して送受される通常のパケット構成を示し、図７（ｂ）は優先順位付きパケット生成部の出力パケットを示す。

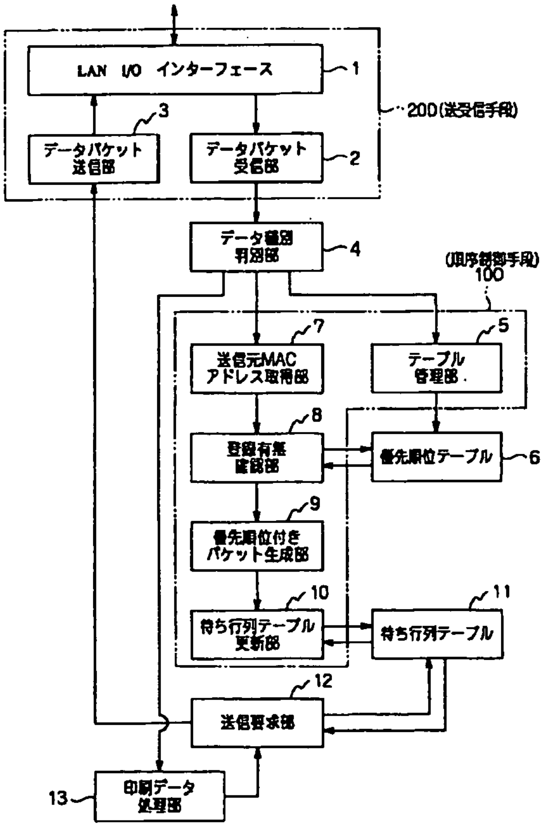
【図８】従来例の構成を示すブロック図である。

【図９】図８におけるＩＤテーブルの内容を示す構成図である。

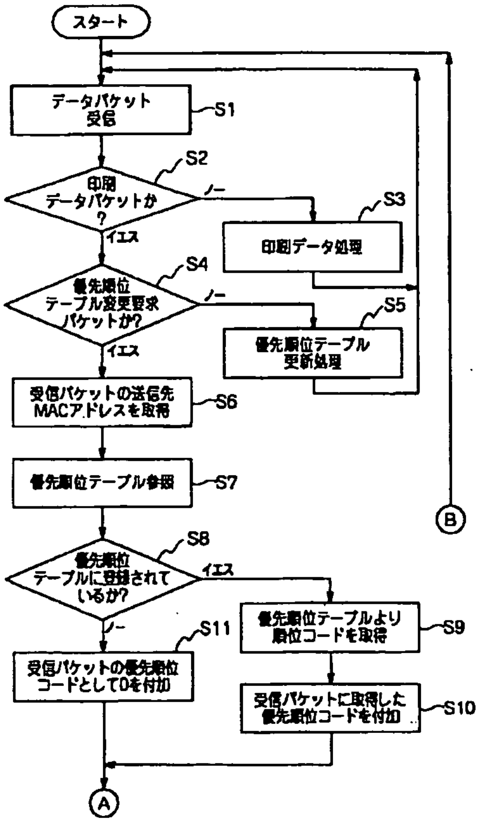
【符号の説明】

４	データ種別判別部
６	優先順位テーブル
１１	待ち行列テーブル
１２	送信要求部
１３	印刷データ処理部
２１	優先順位
２２	ＭＡＣアドレス
４１	ネットワークプリンタ
４２～４６	上位ホスト
１００	順序制御手段
２００	送受信手段

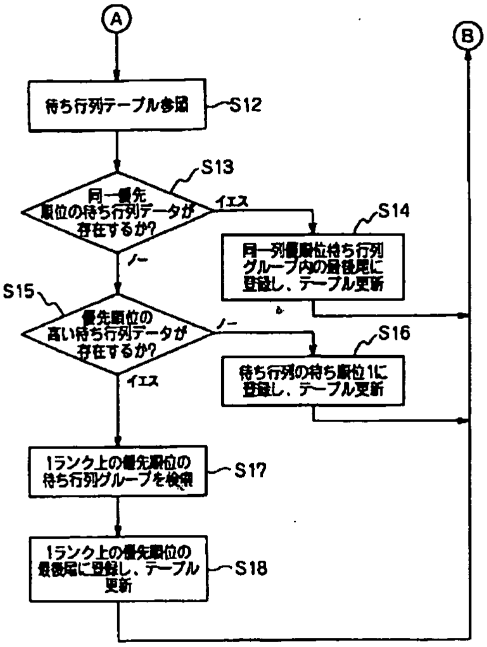
【図１】



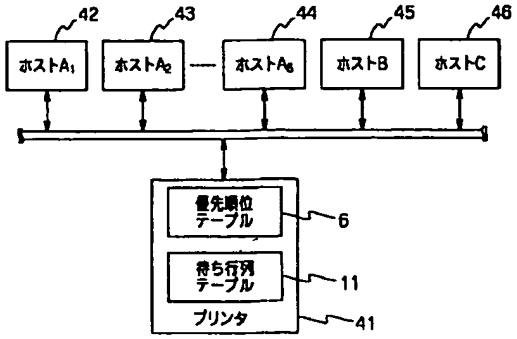
【図２】


スタート
データパケット受信
S1
S2
印刷データパケットか？
ノー
イエス
S3
印刷データ処理
S4
優先順位テーブル変更要求パケットか？
ノー
イエス
S5
優先順位テーブル更新処理
受信パケットの送信先MACアドレスを取得
S6
優先順位テーブル参照
S7
B
S8
優先順位テーブルに登録されているか？
イエス
ノー
優先順位テーブルより順位コードを取得
S9
S11
受信パケットの優先順位コードとして0を付加
受信パケットに取得した優先順位コードを付加
S10
A

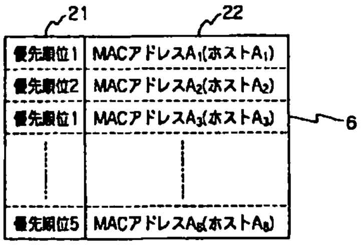
【図3】


A
B
待ち行列テーブル参照
S12
S13
同一優先順位の待ち行列データが存在するか?
イエス
ノー
S14
同一列優順位待ち行列グループ内の最後尾に登録し、テーブル更新
S15
優先順位の高い待ち行列データが存在するか?
ノー
イエス
S16
待ち行列の待ち順位1に登録し、テーブル更新
1ランク上の優先順位の待ち行列グループを検索
S17
1ランク上の優先順位の最後尾に登録し、テーブル更新
S18

【図4】

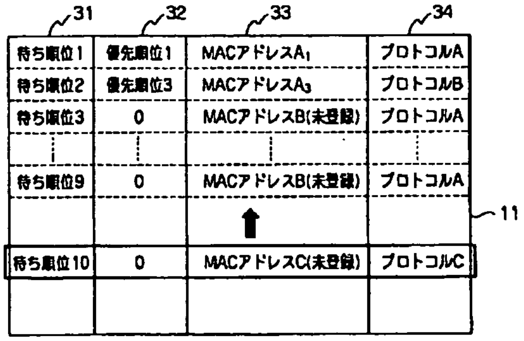


【図5】



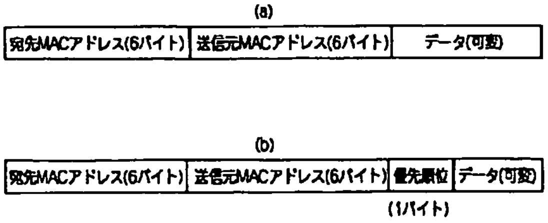
優先順位1	MACアドレスA_1(ホストA_1)
優先順位2	MACアドレスA_2(ホストA_2)
優先順位1	MACアドレスA_3(ホストA_3)
⋮	⋮
優先順位5	MACアドレスA_6(ホストA_6)

【図6】


31
32
33
34
11

待ち順位1	優先順位1	MACアドレスA_1	プロトコルA
待ち順位2	優先順位3	MACアドレスA_3	プロトコルB
待ち順位3	0	MACアドレスB(未登録)	プロトコルA
⋮	⋮	⋮	⋮
待ち順位9	0	MACアドレスB(未登録)	プロトコルA
		⬆	
待ち順位10	0	MACアドレスC(未登録)	プロトコルC

【図7】



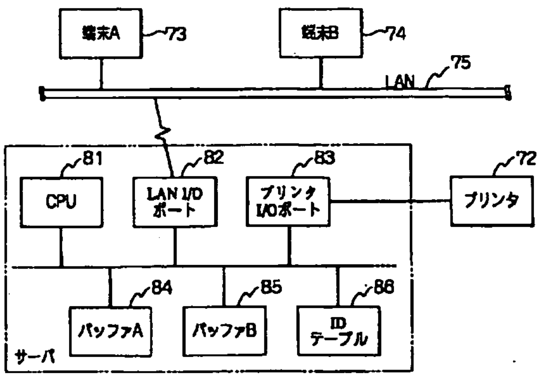
(a)

宛先MACアドレス(6バイト)	送信元MACアドレス(6バイト)	データ(可変)

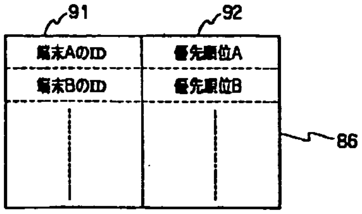
(b)

宛先MACアドレス(6バイト)	送信元MACアドレス(6バイト)	優先順位	データ(可変)
		(1バイト)	

【図8】



【図9】



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